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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/539,243	07/29/2005	Yuichi Takai	3712174.00463	9242

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EXAMINER	
HAN, KWANG S	

ART UNIT	PAPER NUMBER
1795	

NOTIFICATION DATE	DELIVERY MODE
09/16/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

chicago.patents@klgates.com

Office Action Summary	Application No.	Applicant(s)	
	10/539,243	TAKAI, YUICHI	
	Examiner	Art Unit	
	Kwang Han	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 April 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *13-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *13-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

A COMPACT FUEL CELL SEPARATOR INCORPORATING FLUID OXIDANT SUPPY MEANS, A FUEL CELL DEVICE AND AN ELECTRONIC APPLIED DEVICE INCORPORATING THE COMPACT FUEL CELL SEPARATOR

Examiner: K. Han SN: 10/539,243 Art Unit: 1795 September 13, 2010

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 30, 2010 has been entered. Claims 13-17 and 21-24 were amended. Claims 25-27 were added.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

3. Claims 13-16, 21, 23, and 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goto et al. (JP 07-249419, machine translation) in view of Kobayashi (US 5258239).

Regarding claims 13 and 14, Goto is directed towards a fuel cell (examples include phosphoric acid or solid oxide type which inherently include an MEA adapted to receive hydrogen gas as a fuel [0003]) separator comprised of the following:

- a separator body adapted to contact with a generating element (2, 3) creating a generating cell [0041, 0042],
- grooves (60, supply channel) formed on separator body (1) having an opening exposed to one end of the separator body (Drawing 4) [Abstract], and
- flow quantity control valves (59) provided for each channel within the separator body for supplying fluid oxidant into the fluid oxidant channel (Drawings 2 and 3) [0024].

Goto is silent towards the flow quantity control comprising at least one element selected from the group consisting of a fan and a pump.

Goto and Kobayashi are analogous art because both deal with the same problem solving area of providing oxidant fluid flow through a fuel cell device. To one of ordinary skill in the art a metal-air cell is a type of fuel cell since a reactant needs to be provided from an external source.

Kobayashi teaches the use of a diaphragm pump (Figure 2B) in a metal-air cell to provide air flow which is integrated within the cell casing (1) at the air intake port which forms the air flow channel (2) to provide air supply control and enhance the electrical characteristics of the cell (2:14-18). It would have been obvious to one of ordinary skill in the art at the time of the invention to apply Kobayashi's diaphragm pump in place of the flow control valves in Goto's separator channels because Kobayashi teaches that this pump is a device placed in the air flow channel which can provide air supply control and enhance the electrical characteristics of the cell.

The rationale to support a conclusion that the claim would have been obvious is that all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination yielded nothing more than predictable results to one of ordinary skill in the art. (MPEP 2143)

Regarding claim 15, Goto et al. is directed towards grooves comprising a plurality of channels formed on the separator body (Drawing 4) and each of the channels have an opening with a plurality of elements provided at the openings of the channels to individually make a flow of the fluid oxidant in the channels [Abstract].

Regarding claim 16, Goto et al. is further directed towards a separator with a plurality of groups of adjacent channels (60) with each group of adjacent channels having an opening (Drawing 5) and a fluid oxidant supplying elements (59) provided at the opening of the groups of the adjacent channels.

Regarding claim 21, the Applicant is directed towards the discussion for claim 13 above.

Regarding claim 23, the teachings of Goto et al. as discussed above are herein incorporated. Goto et al. is further directed towards a fuel cell body formed by stacking a plurality of generating cells with a pair of separators [0040] (Drawing 2).

Regarding claims 25-26, Goto is silent towards the element having a height smaller than a depth of the oxidant supply channel, however the courts have held that the configuration of the element was a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular

configuration of the element was significant. In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966). Furthermore, one of ordinary skill in the art would recognize that the dimensions of element would be limited to the space constraints as provided by the stacked supply channels.

4. Claims 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goto et al. and Kobayashi as applied to claim 13 and 14 above, and further in view of Shiue et al. (US 6500575) is maintained.

Regarding claims 17-20 the teachings of Goto as discussed above are herein incorporated. Goto et al. discloses a flow quantity control valve (59, 69) having a fin to be oscillated (Drawing 3) to provide a flow of said fluid oxidant and an actuator (bimetal) [0018, 0020] comprised of a shape memory alloys [0020] with different coefficients of thermal expansion [0045] for driving the fin but is silent towards the fluid oxidant supply means being a fan.

Shiue teaches the use of a micro fan in a zinc-air cell to control air flow between air pathways [Abstract] which are fabricated with an actuator comprising a piezoelectric (5:20-46) for the benefit of providing air draft in the cell used to generate electricity. It would have been obvious to one of ordinary skill in the art at the time of the invention to use Shiue's micro fan as the fluid oxidant supply means in Goto's fuel cell because Shiue teaches it as a means to provide greater air draft.

5. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Goto et al. and Kobayashi as applied to claim 14 above, and further in view of Shiue et al. (US 6500575) and Khandkar et al. (US 5856035).

The teachings of Goto et al. and Kobayashi as discussed above are herein incorporated. Goto further discloses the fluid oxidant channels to be formed inside of the separator body, extending along the surface (Drawings 5, 6), but is silent towards the opening elongated in the transverse direction and the fluid oxidant supply means comprising a rotary fan.

Khandkar teaches the use of a separator (44) which includes a trough structure (40, Figure 1) having an elongated opening for the benefit of providing cavities for fuel or air flow (6:17-25; Figure 1). It would have been obvious to one of ordinary skill in the art at the time of the invention to apply Khandkar's elongated opening within the separator structure of Goto and Kobayashi's fuel cell because Khandkar teaches this structure provides for a larger cavity to increase fuel and air flow.

Shiue et al. teaches the use of a micro rotary fan (5:38-41) in a zinc-air cell to control air flow between separators [Abstract] for the benefit of providing air draft in the cell. It would have been obvious to one of ordinary skill in the art at the time of the invention to apply Shiue's micro rotary fan in Goto's separator modified by Khandkar's elongated opening because Shiue teaches it as a device which provides the maximum air draft.

6. Claims 24 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goto et al. in view of Kobayashi and further in view of Pratt et al. (US 6127058).

The teachings of Goto et al. and Kobayashi as discussed above are herein incorporated.

Regarding claim 24, the applicant is directed towards the discussion concerning claim 13 above. Goto is silent towards an electronic applied device comprising a board wherein pluralities of fuel cell bodies are provided.

Pratt teaches a planar fuel cell where a plurality of fuel cell bodies (Figure 2; 4;31-38) are connected with each other on a board (24, frame) for the benefit of minimizing seals, piping, and electrical interconnections. It would have been obvious to one of ordinary skill in the art at the time of the invention to apply Pratt's planar fuel cell arrangement in Goto and Kobayashi's fuel cell because Pratt teaches it minimizes the fuel cell profile and use of seals, piping and electrical interconnections.

Regarding claim 27, Goto, Kobayashi, and Pratt are silent towards the element having a height smaller than a depth of the oxidant supply channel, however the courts have held that the configuration of the element was a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the element was significant. In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966). Furthermore, one of ordinary skill in the art would recognize that the dimensions of element would be limited to the space constraints as provided by the stacked supply channels.

Response to Arguments

7. Applicant's arguments filed April 30, 2010 have been fully considered but they are not persuasive.

Applicant's principal arguments are:

(a) the combination of Goto and Kobayashi fails to disclose or suggest at least one element selected from the group consisting of a fan and a pump provided within the separator body and would not be directed to combine the teachings of the two references,

(b) the Kobayashi reference is directed towards a metal-air cell or battery and one of ordinary skill in the art would recognize it is entirely distinguishable from a fuel cell and the references have differing reasons for use of the flow control element,

(c) the substitution of the control valves of Goto with the air supply pump of Kobayashi would change the principle of operation of Goto and/or render Goto unsatisfactory for its intended purpose.

In response to Applicant's arguments, please consider the following comments:

(a) as discussed in the rejection above, Goto recognizes the need to control the oxidant flow within the fuel cell by using a flow control valve placed within the separator body at the inlet point of the channel. Kobayashi recognizes the use of a diaphragm pump which is placed in the inlet region of the air inflow channel of the fuel cell to control the flow. Both references are directed towards controlling the inflow of an oxidant into a channel with components which are used to control that flow. Since Goto and

Kobayashi are directed towards the same problem solving area of oxidant flow control in a channel, one of ordinary skill in the art can recognize devices which are used to control that flow (valves, pumps, etc.) and would have sufficient motivation to recognize the use of differing devices used for the same purpose and to further modify the teachings of one reference with another,

(b) as discussed previously, a fuel cell is an electrochemical device which generates electricity by being provided with a reactant from an external source. One of ordinary skill in the art recognizes that metal-air cell is a type of fuel cell because it requires an oxidant (reactant) from an external source to be provided to the cell in order for the reactions to occur to generate electricity. The discussion as provided above for both the Goto and Kobayashi reference are directed towards the oxidant flow channels and devices to control the flow of that reactant to the cell. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986),

(c) the Goto reference modified with the teachings of Kobayashi would provide an additional pump placed in the gas passages as recognized by the Application. The operation of the additional pumps would provide further refinement of the flow of gas provided to the passages and would not change the principle operation of the device as disclosed by Goto because the valves being modified with the use of pumps in the

channels would still provide controlled oxidant flow and allow for precise temperature control as required.

Contact/Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kwang Han whose telephone number is (571) 270-5264. The examiner can normally be reached on Monday through Friday 8:00am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on (571) 272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. H./
Examiner, Art Unit 1795

/Dah-Wei D. Yuan/
Supervisory Patent Examiner, Art Unit 1795